

## A.6.2 Planetary Instrument Definition and Development

### 1. Scope of Program

The Planetary Instrument Definition and Development program (PIDDP) supports the advancement of spacecraft-based instrument technology that shows promise for use in scientific investigations on future planetary missions. The goal of the program is not to develop flight-qualified hardware, but rather to define and develop scientific instruments or components of such instruments to the point where the instruments may be proposed in response to future announcements of flight opportunity without additional extensive technology development. The proposed instrument technology must address specific scientific objectives of candidate future missions. New measurement concepts can be proposed, as well as methods to significantly improve the performance of existing instruments and/or the development of technologies that enable integrated instrument packaging (architectures). The emphasis in this NRA is also on the development of miniaturized, low power, low cost instruments for Discovery-class and other similar missions.

Instrument definition and development studies can take place at several stages, from feasibility studies, to conceptual design, to laboratory breadboarding (but not brassboarding) of critical components and complete instruments. Particularly for immature or very complex new instruments, proposers initially may choose to only define or develop the most risky components. However, in all cases of component only development, one or more likely scenarios for possible follow on instrument development should be described. For all (instrument or component) proposals, scientific objectives of those instruments (or proposed follow on instruments), and future candidate missions should be discussed in the proposal. Proposed instruments must address significant scientific questions relevant to stated NASA goals.

Results of PIDDP work have contributed to the eventual development of flight hardware flown on or selected for many NASA missions. Since this is the goal of the PIDDP program, proposals should consider the potential of the proposed effort for enhancing future technology validation and science missions.

Because of the recent creation of the Astrobiology Science and Technology Instrument Development (ASTID) program (see Appendix A.6.4 in this NRA), astrobiology-focused instrument definition and development proposals should not be submitted to PIDDP, but rather should be submitted to ASTID. It is recognized that some instruments will overlap between the programs, e.g., instruments that do astrobiology and geochemistry. However, if the primary focus of a proposed instrument is astrobiology it should be submitted to ASTID, and otherwise it should be submitted to PIDDP. If a proposal really addresses both program elements somewhat equally, it can be submitted to both and overlap will be resolved at the programmatic level at the time of selections. Proposers should be aware that each of these programs has different constraints (e.g., developmental levels that are appropriate, timeframes of missions for which instruments

are being developed, appropriateness of nonspacecraft instruments, etc.), so proposers should carefully read the relevant program descriptions.

Proposals not appropriate for the PIDDP are those that seek to develop laboratory instruments, ground-based or airborne telescopes, auxiliary instrumentation such as spectrometers for telescopes, onboard data processing or data compression studies, or any spacecraft technology that does not directly address science instrumentation.

While this program element will be advertised annually, the nature of specific efforts selected for funding will vary, *with emphasis in any given year placed on preparation for the nearest term missions for which instruments have not yet been selected.* However, there can also be support provided for long lead-time definition studies, for innovative approaches that may provide entirely new classes of instruments, for the development of new enabling technology for missions farther in the future, and/or for detector development studies that may advance the technology for a wide range of planetary instrumentation applications. Therefore, proposers are encouraged to relate their proposed efforts as closely as possible to specific future planetary missions and demonstrate how their technology addresses the scientific goals of these missions.

## 2. PIDDP-Focused Future Missions

Proposals for instrument definition and development for certain of the following future missions will be considered for funding through the PIDDP.

- *Discovery Program*

The Discovery Program is envisaged as a series of focused, quick-turnaround missions. Development time will be approximately 36 months. Solicitations occur approximately every 18-24 months. The Discovery missions may include flybys, orbiters, landers, airplanes, balloons, Earth orbiting telescopes, and sample return missions to a variety of solar system objects to study surface and atmospheric composition, thermal structure, meteorology, geoscience, topography, dynamics, and field and particle environments. Instrumentation and techniques addressing critical scientific questions in this broad range are appropriate development efforts under the PIDDP. Technology applicable to multiple missions and investigations will have higher priority for funding. Proposals for the development of new instruments for missions already selected for flight or selected for Discovery Phase A study and/or development will not be accepted under this NRA.

- *Mars Surveyor Missions*

The Mars Surveyor missions include orbiters and landers that utilize small to medium spacecraft. For upcoming missions, U.S. science instruments for the Mars Surveyor 2001 orbiter and for the Mars Surveyor 2003 missions have already been selected. Any new PIDDP level developments funded as a result of this NRA will be too late for the 2005 mission, so proposals relevant to the 2005 mission are not appropriate under this NRA. Future launches to Mars will occur approximately every 26 months. Scientific payloads will consist of small, lightweight, low power consumption instruments.

Instrument development proposals for both U.S. and international follow-on missions to Mars (i.e., beyond the Mars 2005 mission) are appropriate under this NRA. Instrument technologies for the *in situ* exploration of Mars are of particular interest for future missions. The PIDDP seeks new concepts for Mars surface science, including, but not limited to, potential instruments for radiometric age-dating, soil/rock mineralogy and chemistry, water/ice detection and characterization, drilling/coring, and atmospheric analyses. Some, but not all of these, are truly new and complex instrument concepts for planetary exploration. As such, proposers may choose to initially pursue only development of the most challenging components, as long as discussion of their connection to possible future instruments and scientific objectives is clearly discussed.

- *Outer Solar System Missions*

Missions to the outer planets and satellites are a specific NASA objective. At the time of the writing of this document, timing and elements of the outer planets program were being reconsidered. PIDDP solicits instrument concepts relevant to possible future outer planet missions, although proposers are reminded that emphasis in any PIDDP selection will be placed on preparation for the nearest term missions for which instruments have not yet been selected. This determination will be made at the time of selection based upon NASA's plans at that time.

- *Origins of Solar Systems*

NASA's long-range strategy includes flight missions that will follow and extend the ground-based phase of the search for planets about other stars and several approaches for space-based platforms addressing the search for extrasolar planetary systems have been identified. Breadboard studies of technologies and instruments (consistent with the limited scope of the PIDDP) that could contribute to the space-based search for extrasolar planets are appropriate for this NRA.

### 3. Programmatic Considerations

Proposals are solicited under this NRA for instrument definition and development only for the missions or classes of missions described in Section 2 above. Therefore, all proposals submitted to PIDDP must specify:

- The mission or class of missions for which the proposed instrument is applicable. Instruments that might fly on a number of missions will be given priority over those applicable to only a single mission.
- The science objectives of the proposed instrument. The relationship between the science objectives and the instrumental capabilities must be clearly demonstrated. For those instruments applicable to many missions or capable of meeting multiple science objectives, examples of science objectives for the proposed mission or missions should be given.
- Technological advances to be pursued as an inherent element of achieving the science objectives. Proposers are also asked to identify potential mechanisms that could facilitate transfer of these technologies to other users, including the private sector, for possible application beyond the immediate one of meeting mission science objectives.

It is anticipated that the scientific payloads on all future solar system exploration missions will be limited to small, low mass, low power consumption, and low cost instruments. For this reason, only proposals for instrument definition and development satisfying these general specifications will be considered for support.

The evaluation criteria in the *OSS Guidebook – 2001* are fully applicable to the PIDDP, including evaluation of scientific and technical merit, relevance to NASA's objectives, and cost. In addition, however, the determination of a proposal's relevance shall also take into account the following factors:

- The extent to which the proposed instrument is applicable to multiple missions in the Exploration of the Solar System science theme and/or Origins of Solar System program element (see Section 2);
- The extent to which the instrument addresses a priority science goal of the mission or missions for which it would be a candidate for flight;
- Either the near-term nature of the mission or missions in question, or the necessity of embarking on a long lead-time development of a very important instrument contemplated for flight on a mission that is of high priority, even though it is not in the near-term queue; and

- Whether the instrument is deemed to fall within the scope of PIDDP, including whether it too developmentally mature for PIDDP.

It should be noted that the contemplated sequence of missions described in this NRA is a best current estimate and is subject to change. NASA reserves the right to make a determination of relevance based on the contemplated sequence of missions as it is understood at the time of proposal evaluation and selection.

#### 4. Programmatic Information

Full, new proposals are sought for either entirely new studies or for the extension of PIDDP studies terminating in FY 2001. Proposals may specify periods of performance of up to three years. It is expected that there will be approximately \$2.3M dollars available for new (and extension) proposals, and that 10 to 15 studies will be supported with these funds.

Annual Progress Reports: Holders of existing multiple year awards that are entering their second or third year of a three-year award from a previous NRA for this program element must submit a request for an annual funding allotment for their award. This request, in the form of a *Annual Progress Report*, is due by the same deadline as for new proposals for this program element (see Table 1 or 2 in the Summary of Solicitation of this NRA). These *Progress Reports* will be screened by the same peer review panel that will be convened to review new proposals as an aid to NASA's evaluation of existing awards. Such a *Progress Report* should not exceed three single-spaced, typewritten pages with roughly two pages used for a description of the progress made during the previous year and the remainder to a statement of the work planned for the coming year (Note: this three page limit does not include references, figures, reprints, or appendices). The *Progress Report* should be prefaced by a copy of the proposal's original Cover Page/Proposal Summary and a copy of the original approved budget. Note that any request for an augmentation to the budget must be supported by detailed information in conformance with Section 2.3.10 of the *OSS Guidebook-2001* (see further in section entitled "Important Information" below).

### IMPORTANT INFORMATION

**As a modification to the default specification in the *Summary of Solicitation* of this NRA , 18 copies of the proposal are required, plus the signed original.**

As discussed in the *Summary of Solicitation* of this NRA, the Office of Space Science (OSS) is now using a single, unified set of instructions for the submission of proposals. This material is contained in the document entitled *OSS Guidebook for Proposers Responding to NASA Research Announcement – 2001* (or "*OSS Guidebook – 2001*" for short) that is accessible by opening "Research Opportunities and Data" from the menu at URL <http://spacescience.nasa.gov> , or directly at URL <http://spacescience.nasa.gov/research/ossguidebook/> . This

NRA's *Summary of Solicitation* also contains the schedule and instructions for the electronic submission of a Notice of Intent (NOI) to propose and a proposal's *Cover Page/Proposal Summary*, for electronic access to the required *Budget Summary* form, and the mailing address for the submission of a proposal.

Questions about this program element may be directed to the cognizant Discipline Scientist:

Up through June 22, 2001:

Dr. Bruce Betts  
Research Program Management Division  
Code SR  
Office of Space Science  
NASA Headquarters  
Washington, DC 20546  
Telephone: (202) 358-0297  
E-mail: [bruce.betts@hq.nasa.gov](mailto:bruce.betts@hq.nasa.gov)

After June 22, 2001:

Mr. Joseph Boyce  
Research Program Management Division  
Code SR  
Office of Space Science  
NASA Headquarters  
Washington, DC 20546  
Telephone: (202) 358-0302  
E-mail: [joseph.boyce@hq.nasa.gov](mailto:joseph.boyce@hq.nasa.gov)

**RESEARCH OPPORTUNITIES IN SPACE SCIENCE - 2001  
(ROSS-2001)**

NASA Research Announcement  
Soliciting Basic Research Proposals

NRA 01-OSS-01  
Issued: January 26, 2001

Proposals Due  
Starting April 6, 2001,  
and Ending November 9, 2001

Office of Space Science  
National Aeronautics and Space Administration  
Washington, DC 20546-0001



# RESEARCH OPPORTUNITIES IN SPACE SCIENCE - 2001 (ROSS-2001)

## SUMMARY OF SOLICITATION

### • INTRODUCTION AND GENERAL POLICIES

The stated mission of the Space Science Enterprise of the National Aeronautics and Space Administration (NASA) is to solve the mysteries of the universe, to explore the solar system, to discover planets around other stars, and to search for life beyond Earth. To carry out this mission, NASA's Office of Space Science (OSS) sponsors a broad range of research programs relevant to its four Science Themes, which are defined as:

- *Astronomical Search for Origins and Planetary Systems (ASO)* that addresses the origins of galaxies, stars, proto-planetary and extra-solar planetary systems, Earth-like planets, and the origin of life;
- *Solar System Exploration* (abbreviated as ESS) that seeks to understand all aspects of our Solar System, including the planets, satellites, small bodies, and solar system materials, and the search for possible habitats of life beyond Earth;
- *Structure and Evolution of the Universe (SEU)* that involves the study of cosmology, the large scale structure of the universe, the evolution of stars and galaxies, including the Milky Way and objects with extreme physical conditions, and an examination of the ultimate limits of gravity and energy in the Universe; and
- *The Sun-Earth Connection (SEC)* that concerns the Sun as a typical star and as the controlling agent of the space environment of the Solar System, especially the Earth.

Stated informally, these four themes seek to answer four fundamental questions, "How did the Universe begin and evolve?" "Where did we come from?" "Where are we going?" and "Are we alone?" Further information about these themes as well as access to the most recent Strategic Plans (as of late 2000) for both NASA and OSS may be found through the OSS homepage on the World Wide Web at <http://spacescience.nasa.gov>. In addition, this NRA may be found through the menu listings "*Research Opportunities and Data/OPEN Opportunities*" at this same Web site.

OSS pursues these fundamental science themes using a wide variety of both space flight programs and investigations in basic science and technology. This current NASA Research Announcement (NRA) ROSS-2001 solicits proposals for Supporting Research and Technology (SR&T) investigations that seek to understand naturally occurring space phenomena and space science-related technologies across a full range of science subdisciplines relevant to OSS interests. These program elements are listed in the index to Appendix A at the

end of this Summary of Solicitation. Table 1 lists these program elements in the order of their respective due dates for the submission of proposals, while Table 2 lists them in according to their order shown in Appendix A. As a guide to their relationships, Tables 1 and 2 also cross references these program elements to the OSS Science Themes as noted above. Appendix A contains detailed descriptions of each element, and questions about each may be directed to their respective Discipline Scientists who are identified in the section entitled “Programmatic Information” that concludes the description of each program element.

Beginning with the ROSS NRA issued in February 2000 (NRA 00-OSS-01), the program elements offered through this series of solicitations have been grouped into nine “clusters” as indicated in the Table of Contents of Appendix A at the end of this Summary of Solicitation. It is a goal to group the due dates for proposals for the program elements within each cluster closely together in time to allow for the possibility of the reallocation of funding within a cluster once all its related proposals are reviewed. In addition, recommendations from a comparative review of all clusters in mid-2001 will be used to help determine the cluster structure and content, as well as funding allocations for Fiscal Year's 2002-2004 (October 1, 2001, through September 30, 2003). Questions about this evolving approach to the structure and review of the OSS SR&T program may be sent to:

Dr. Guenter R. Riegler  
Director  
Research Program Management Division  
Code SR  
Office of Space Science  
NASA Headquarters  
Washington, DC 20546-0001  
Telephone: 202-358-1588  
E-mail: guenter.riegler@hq.nasa.gov  
Facsimile: 202-358-3097

Although Tables 1 and 2 effectively cross-references these newly defined clusters to many of the traditional ROSS Program Elements and the four OSS Science Themes, the section entitled “INTRODUCTION AND OVERVIEW” of Appendix A also provides additional narrative material that expands on these relationships. Therefore, anyone interested in applying to this NRA is urged to read the relevant parts of this introductory section to Appendix A for a full understanding of whether their research interests are relevant to NASA OSS interests, and, if so, to which cluster and program element their proposal should be submitted. It is especially important to note that the overall objective of each of these program elements to contribute as effectively and directly as possible to the achievement of OSS strategic goals. Therefore, priority for selection will be given to those proposals that most clearly demonstrate the potential for making such contribution (see also the discussion of the evaluation criteria below).

Recommendations for funding for the proposals submitted to this NRA will be based on the peer evaluation of each proposal's intrinsic merit, its relevance to NASA's objectives, and its cost. For the purposes of this NRA: (i) by intrinsic merit is meant the proposal's science and technical merits, the capabilities of the proposing institution, the qualifications of the proposing personnel, and the overall standing of the proposal among similar proposals and/or evaluation against the state-of-the-art; (ii) by relevance to NASA's objectives is meant the proposal's relevance to the objectives of the OSS science program element as described in this NRA to which the proposal is submitted; and (iii) by cost is meant the reasonableness and realism of the proposal's requested budget, in addition to its size. In all cases, the Government's obligation to make awards is contingent upon the availability of appropriated funds from which payment can be made and upon the receipt of proposals in response to this NRA that NASA determines are acceptable for award.

Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit institutions, NASA Centers, and other Government agencies. Historically Black Colleges and Universities (HBCU's), other minority educational institutions, and small businesses and organizations owned and controlled by socially and economically disadvantaged individuals or women are particularly encouraged to apply. Participation by non-U.S. organizations in this program is encouraged subject to NASA's policy of no-exchange-of-funds (see further information in the "*OSS Guidebook for Proposers...*" discussed below).

- NEW INSTRUCTIONS FOR PREPARATION/SUBMISSION OF PROPOSALS

Starting in 1998, the Office of Space Science began to use a single, unified set of instructions for the submission of proposals for almost all of its NRA's that were incorporated into each NRA. Such standardization has proven to be of significant value to NASA to help ensure the uniform handling and processing of submitted proposals, as well as to researchers interested in responding to multiple program elements within the ROSS NRA's, or even different OSS NRA's. However, starting with this ROSS-2001 NRA, these proposal policies and procedures, as well as those for NASA's review and selection of proposals for funding, are now described in a separate document entitled "*Office of Space Science (OSS) Guidebook for Proposers Responding to NASA Research Announcement – January 2001*" (abbreviated as "*OSS Guidebook – 2001*") that is accessible by opening "*Research Opportunities and Data*" from the menu at the World Wide Web URL <http://space.science.nasa.gov>, or may be directly accessed at URL <http://space.science.nasa.gov/research/ossguidebook/>.

By reference, this *OSS Guidebook – 2001* is hereby incorporated into this ROSS-2001 NRA, and proposers to this NRA are responsible for understanding and complying with its procedures before preparing and submitting their proposals. In particular, its Chapter 2 ("Proposal Preparation and Organization") and Chapter 3 ("Proposal Submission Procedures") largely

replace the contents of “Chapter C” in most OSS NRA's issued during the previous three years. Proposers familiar with these past OSS NRA's will find that these instructions are essentially unchanged from those introduced starting in 1998. Also, note that the NASA-required proposal *Budget Summary* form is now available electronically through the Web site designated for the *Cover Page/Proposal Summary* (see Summary Information below) for printing in hard copy for submission with the hard copies of the proposal. The other chapters and appendices of this *OSS Guidebook – 2001* provide supplemental information about the entire NRA process, including NASA policies for the solicitation of proposals (including those involving non-U.S. participation), guidelines for writing complete and effective proposals, the NASA policies and procedures for the proposal review and selection processes, and for issuing and managing the awards to the institutions that submitted selected proposals, and Frequently Asked Questions (FAQ's) about a variety of proposal and award processes and procedures.

Comments and suggestions of any nature about this *OSS Guidebook – 2001* are encouraged and welcomed and may be directed at any time to Dr. David Bohlin, Research Program Management Division, Code SR, Office of Space Science, NASA Headquarters, Washington, DC 20546-0001; telephone: (202) 358-0880; E-mail: [david.bohlin@hq.nasa.gov](mailto:david.bohlin@hq.nasa.gov) (if submitted by E-mail, use "Proposer's Guidebook" as the Subject of the message).

The World Wide Web site for submitting both a Notice of Intent (NOI) to propose and a proposal's *Cover Page/Proposal Summary* is given in the Summary Information below (Chapters 2 and 3 of the *OSS Guidebook – 2001* as discussed above contains detailed information about these two items). This Web site will be open for the submission of NOI's for any given program element in this NRA for typically 30 days, starting about 90 days before the proposal due date, and the site will be open for the submission of the other required proposal materials starting about 45 days before the proposal due date (see Tables 1 and 2 below for all schedules). A point of contact for assistance in accessing and/or using this Web site is given in the Summary Information below.

- OSS EDUCATION AND PUBLIC OUTREACH (E/PO) PROGRAM

OSS policy continues to strongly encourage participation by the space science community in education and public outreach activities with the goal of enhancing the Nation's formal education system and contributing to the broad public understanding of science, mathematics, and technology. A significant national program in space science education and outreach is now underway, and OSS's demonstrated contributions to education and outreach have now become an important part of the broader justification for the public support of space science (for further details open “*Education and Public Outreach*” on the OSS homepage at <http://spacescience.nasa.gov> ).

Since 1998 when it started to offer the opportunity to propose E/PO activities in conjunction with its NRA's, the Office of Space Science has received many constructive comments from

members of the space science community as to how to improve its efforts to involve space scientists in education and public outreach. Based on the experience of the past few years and these comments, OSS is making a number of important changes in procedure this year. In particular, starting with this OSS ROSS-2001 NRA, E/PO proposals will be solicited only from those proposers whose research proposals have been already selected for an award. This change should decrease the overall workload on the space science community, increase the likelihood that more E/PO proposals of merit will be funded, and more effectively encourage successful science proposers to add an E/PO component to their research effort.

Therefore, only those proposers to this NRA who are eventually selected on the basis of the excellence of their research awards will be eligible to propose a supplemental E/PO program in accord with the OSS E/PO policies and guidelines. At the time of the release of this NRA it is anticipated that selected Principal Investigators will have two windows of opportunity to submit an E/PO proposal, either: (i) no later than 45 days after the date of the letter of selection of their parent research proposal, with the anticipation of starting the proposed E/PO activity within the first third of the first year of parent research award; or (ii) no later than 75 days before the yearly anniversary date of their award, with the anticipation of starting the proposed E/PO activity in conjunction with next yearly funding supplement of their multiple year award. In either case, consistent with the past E/PO policies and to ease the burden of NASA's administration of these supplemental awards, the total period of performance of an E/PO award will be restricted to that of its parent research award.

The current description of the underlying strategy and implementation plans for the OSS E/PO program may be found through the menu item *Education and Public Outreach* on the OSS homepage at <http://spacescience.nasa.gov>. The specific policies and procedures for writing and submitting supplemental E/PO proposals in conjunction with proposals selected through this NRA will be posted no later than the end of July 2001, which will be sufficiently early to allow those selected for the program elements with the earliest proposal due dates (see Table 1 below) to organize and submit an E/PO proposal. Questions and/or comments about this OSS E/PO program are sincerely welcomed and may be directed to Dr. David Bohlin, Research Program Management Division, Code SR, Office of Space Science, NASA Headquarters, Washington, DC 20546-0001 (telephone: 202-358-0880; E-mail: [david.bohlin@hq.nasa.gov](mailto:david.bohlin@hq.nasa.gov))

- ITEMS OF SPECIAL IMPORTANCE FOR THIS NRA

(1) Because this ROSS-2001 NRA is being released far in advance of many of the deadlines given in Tables 1 or 2, additional programmatic information for any given entry may develop before proposals are due. If so, such material will be added as an Amendment to this NRA as posted at its NRA Web site no later than 30 days before the proposal deadline. Although NASA OSS will also send an electronic alert of any such amendments to all subscribers of its electronic notification system (see Special Note (3) below), it is the

responsibility of prospective proposers to check this NRA Web site for updates concerning the program element(s) and/or cluster(s) of interest.

(2) OSS now requires the electronic submission of certain key elements of proposals through the World Wide Web (see below in the Summary Information), and this practice continues with this NRA. While every effort is made to ensure the reliability and ease of accessibility of this Web site, and to maintain a point of contact for assistance via E-mail, difficulty in accessing and/or using this site may arise at any point on the Internet including the user's own equipment. Therefore, prospective proposers are urged to familiarize themselves with this site and to submit the required proposal materials well in advance of the deadline(s) of the program element(s) of interest.

(3) OSS maintains an electronic notification system to alert interested subscribers of the impending release of its research program announcements. Subscription to this service is accomplished through the menu item *Get E-mail Announcements* on the OSS home page at <http://spacescience.nasa.gov> by following the instructions for *Space Science Research Announcements*. Owing to the increasingly multidisciplinary nature of OSS programs, this electronic service will notify subscribers of all future NASA OSS program announcements regardless of its type and objective (10 to 15 per year). Regardless of whether this service is subscribed to or not, all OSS research announcements may be accessed from the Web as soon as they are posted (about 8:30 a.m. Eastern Time on the day of release) through *Research Opportunities and Data* on the OSS homepage.

- SUMMARY INFORMATION APPLICABLE TO THIS NRA

- Program alphanumeric identifier: NRA 01-OSS-01
- Date of NRA issue: January 26, 2001

- Guidance for preparation and submission of proposals:

“OSS Guidebook for Proposers – 2001” at URL  
<http://spacescience.nasa.gov/research/ossguidebook/>

- Submission of Notice of Intent (NOI) to propose:

- Due date: See Table 1 or 2 below for program element of interest (typically 60 days prior to the Proposal Deadline)

- Web site for electronic submission: <http://props.oss.hq.nasa.gov>  
 (contact for help: [deb.tripp@hq.nasa.gov](mailto:deb.tripp@hq.nasa.gov))

- Electronic submission of the proposal’s Cover Page/Proposal Summary:

- Deadline: See Table 1 or 2 below for program element of interest.

- Web site for electronic submission: <http://props.oss.hq.nasa.gov> (open for submissions starting about 45 days in advance of proposal due date for each program element; (contact for help: [deb.tripp@hq.nasa.gov](mailto:deb.tripp@hq.nasa.gov))

- Web site for download of proposal Budget Summary form:

<http://props.oss.hq.nasa.gov>  
 (contact for help: [deb.tripp@hq.nasa.gov](mailto:deb.tripp@hq.nasa.gov))

- Submission of hard copy of proposals:

- Page limits: Default values are given in Section 2.3 of “OSS Guidebook – 2001” (unless otherwise specified in Appendix A of this NRA).

- Required number: Signed original plus 15 copies (unless otherwise specified in Appendix A of this NRA).

- Deadlines: 5 p.m. Eastern Time on dates in Table 1 or 2 below.

- Address for submission by US Postal Service, commercial delivery, or courier:

*Name of Program Element*  
ROSS-2001 NRA  
NASA Peer Review Services  
Suite 200  
500 E Street, SW  
Washington, DC 20024  
Telephone: (202) 479-9030

- Selecting Official: Director or Deputy Director  
Research Program Management Division  
Office of Space Science
- Announcement of selections: Goal: 150 days after proposal due date.
- Initiation of funding for new awards: Goal: 46 days after proposal selection.
- Further information:
  - Specific science program elements: Discipline Scientist listed for each program element in Appendix A.
  - General NRA policies and procedures: Dr. David Bohlin  
Research Program Management Division  
Code SR  
Office of Space Science  
National Aeronautics and Space  
Administration  
Washington, DC 20546-0001  
Phone: (202) 358-0880  
E-mail: [david.bohlin@hq.nasa.gov](mailto:david.bohlin@hq.nasa.gov)

Your interest and cooperation in responding to this ROSS-2001 NRA are appreciated. Comments about the inclusive nature and/or structure of this NRA for the OSS supporting research and analysis programs are welcome and may be directed to either the Discipline Scientists identified for each program element in Appendix A or to the point of contact for General NRA Procedures identified above.

Alan N. Bunner  
Science Program Director  
Structure and Evolution of the Universe

Jay Bergstralh  
Acting Science Program Director  
Solar System Exploration

Anne L. Kinney  
Science Program Director  
Astronomical Search for Origins  
and Planetary Systems

George L. Withbroe  
Science Program Director  
The Sun-Earth Connection

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A.7	<u>SPACE ASTROPHYSICS RESEARCH AND ANALYSIS</u>	A.7-1
A.8	<u>HIGH ENERGY ASTROPHYSICS</u>	
A.9	<u>INTERDISCIPLINARY PROGRAM ELEMENTS</u>	

**TABLE 1**


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**SCIENCE PROGRAM ELEMENTS SOLICITED IN THE ROSS-2001 NRA**  
**(in order of the proposal due dates)**

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Cluster	NRA Appendix	Science Program Element (see Appendix A)	NOI Due Date	Proposal Due Date	Relevant OSS Science Themes [1]			
					ASO	SEU	ESS	SEC
A.8	A .8.1	X-ray and Gamma-ray Astrophysics	2/23/01	4/06/01		X		
A.8	A.8.2	Cosmic Ray Astrophysics	2/23/01	4/06/01		X		
A.1	A.1.2	Sun-Earth Connection Guest Investigator	2/23/01	4/20/01				X
A.5	A.5.3	Planetary Atmospheres [2]	2/23/01	4/20/01			X	
A.5	A.5.4	Planetary Suborbital Research	2/13/01	4/20/01			X	
A.1	A.1.1	Sun-Earth Connection Theory	3/02/01	4/27/01				X
A.1	A.1.4	Astrophysics Data	3/02/01	5/04/01	X	X	X	
A.1	A.1.5	Long-Term Space Astrophysics	3/02/01	5/04/01	X	X	X	
A.4	A.4.2	Planetary Geology and Geophysics [2]	3/09/01	5/10/01			X	
A.4	A.4.1	Cosmochemistry [2]	3/23/01	5/18/01	X		X	
A.4	A.4.3	Origins of Solar Systems	3/30/01	6/01/01	X		X	
A.5	A.5.1	Planetary Astronomy [2]	4/13/01	6/15/01	X		X	
A.5	A.5.2	Near Earth Object Observations	4/13/01	6/15/01	X		X	

A.7	A.7	Space Astrophysics Research and Analysis [3]	4/06/01	6/21/01	X	X		
A.3	A.3	Geospace Sciences [4]	5/02/01	6/22/01			X	X
A.1	A.1.6	Astrophysics Theory	5/25/01	7/20/01	X	X		
A.6	A.6.1	Exobiology [2]	6/08/01	8/03/01	X		X	
A.6	A.6.2	Planetary Instrument Definition and Development	6/07/01	8/08/01			X	
A.2	A.2	Solar and Heliospheric Physics	6/22/01	8/24/01				X
A.4	A.4.4	Mars Data Analysis	7/06/01	8/31/01			X	
A.1	A.1.3	Living With a Star Targeted Research and Technology	7/18/01	9/19/01				X
A.9	A.9.1	Applied Information Systems Research	7/27/01	9/26/01	X	X	X	X
A.5	A.6.4	Astrobiology Science and Technology	9/14/01	11/09/01	X		X	
A.6	A.6.3	Planetary Major Equipment [2]	See ESS Program Element of interest. [2]		X		X	
A.5	A.4.5	Discovery Sample Return Lab. Instruments and Data Analysis	TBD	TBD	X		X	

[1] ASO: Astronomical Search for Origins; SEU: Structure and Evolution of the Universe; ESS: Solar System Exploration; SEC: The Sun-Earth Connection.

[2] The proposals for Planetary Major Equipment program element A.6.3 may be submitted in conjunction with program elements A.4.1: Cosmochemistry; A.4.2: Planetary Geology and Geophysics; A.5.1: Planetary Astronomy; A.5.3: Planetary Atmospheres; and A.6.1 Exobiology.

[3] The Space Astrophysics Research and Analysis cluster includes the following program elements that were separately identified in the ROSS-1998 and -1999 NRA's: Ultraviolet, Visible, and Gravitational Astrophysics; Infrared/Submillimeter/Radio/Interferometry Astronomy; Space Astrophysics Detectors; and Astrophysics Suborbital.

[4] The Geospace Sciences cluster includes the following program elements that were separately identified in previous ROSS-1998 and -1999 NRA's: Ionospheric, Thermospheric, and Mesospheric (ITM) Physics; Magnetosphere Physics; and Magnetospheric and ITM Low Cost Access to Space.

**TABLE 2**


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**SCIENCE PROGRAM ELEMENTS SOLICITED IN THE ROSS-2001 NRA**  
**(in order of NRA Table of Contents)**

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Cluster	NRA Appendix	Science Program Element (see Appendix A)	NOI Due Date	Proposal Due Date	Relevant OSS Science Themes [1]			
					ASO	SEU	ESS	SEC
A.1	A.1.1	Sun-Earth Connection Theory	3/02/01	4/27/01				X
A.1	A.1.2	Sun-Earth Connection Guest Investigator	2/23/01	4/20/01				X
A.1	A.1.3	Living With a Star Targeted Research and Technology	7/18/01	9/19/01				X
A.1	A.1.4	Astrophysics Data	3/02/01	5/04/01	X	X	X	
A.1	A.1.5	Long-Term Space Astrophysics	3/02/01	5/04/01	X	X	X	
A.1	A.1.6	Astrophysics Theory	5/25/01	7/20/01	X	X		
A.2	A.2	Solar and Heliospheric Physics	6/22/01	8/24/01				X
A.3	A.3	Geospace Sciences [4]	5/02/01	6/22/01			X	X
A.4	A.4.1	Cosmochemistry [2]	3/23/01	5/18/01	X		X	
A.4	A.4.2	Planetary Geology and Geophysics [2]	3/09/01	5/10/01			X	
A.4	A.4.3	Origins of Solar Systems	3/30/01	6/01/01	X		X	
A.4	A.4.4	Mars Data Analysis	7/06/01	8/31/01			X	
A.5	A.4.5	Discovery Sample Return Lab. Instruments and Data Analysis	TBD	TBD	X		X	

A.5	A.5.1	Planetary Astronomy [2]	4/13/01	6/15/01	X		X	
A.5	A.5.2	Near Earth Object Observations	4/13/01	6/15/01	X		X	
A.5	A.5.3	Planetary Atmospheres [2]	2/23/01	4/20/01			X	
A.5	A.5.4	Planetary Suborbital Research	2/13/01	4/20/01			X	
A.6	A.6.1	Exobiology [2]	6/08/01	8/03/01	X		X	
A.6	A.6.2	Planetary Instrument Definition and Development	6/07/01	8/08/01			X	
A.6	A.6.3	Planetary Major Equipment [2]	See ESS Program Element of interest. [2]		X		X	
A.5	A.6.4	Astrobiology Science and Technology	9/14/01	11/09/01	X		X	
A.7	A.7	Space Astrophysics Research and Analysis [3]	4/06/01	6/21/01	X	X		
A.8	A.8.1	X-ray and Gamma-ray Astrophysics	2/23/01	4/06/01		X		
A.8	A.8.2	Cosmic Ray Astrophysics	2/23/01	4/06/01		X		
A.9	A.9.1	Applied Information Systems Research	7/27/01	9/26/01	X	X	X	X

[1] ASO: Astronomical Search for Origins; SEU: Structure and Evolution of the Universe; ESS: Solar System Exploration; SEC: The Sun-Earth Connection.

[2] The proposals for Planetary Major Equipment program element A.6.3 may be submitted in conjunction with program elements A.4.1: Cosmochemistry; A.4.2: Planetary Geology and Geophysics; A.5.1: Planetary Astronomy; A.5.3: Planetary Atmospheres; and A.6.1 Exobiology.

[3] The Space Astrophysics Research and Analysis cluster includes the following program elements that were separately identified in the ROSS-1998 and -1999 NRA's: Ultraviolet, Visible, and Gravitational Astrophysics; Infrared/Submillimeter/Radio/Interferometry Astronomy; Space Astrophysics Detectors; and Astrophysics Suborbital.

[4] The Geospace Sciences cluster includes the following program elements that were separately identified in previous ROSS-1998 and -1999 NRA's: Ionospheric, Thermospheric, and Mesospheric (ITM) Physics; Magnetosphere Physics; and Magnetospheric and ITM Low Cost Access to Space.

